

# Claims

[c1] 1.A leaded motor fuel additive composition which reduces and modifies both fuel intake system and combustion chamber deposit formation for the purpose of reducing engine octane requirement increase and allows the use of lower levels of alkyl lead while retaining engine performance comprising a mixture of:  
(a)a fuel conditioner component comprising:(i)from about 2 to about 50 weight percent, based upon the total weight of the fuel conditioner component, of a polar oxygenated hydrocarbon having an average molecular weight in the range of about 200 to about 500, an acid number in the range of about 25 to about 175, and a saponification number in the range of about 30 to about 250, and(ii)from about 2 to about 50 weight percent, based upon the total weight of the fuel conditioner component, of an oxygenated compatibilizing agent preferably having a solubility parameter in the range of about 7.0 to about 14.0 and moderate to strong hydrogen capacity.(b)an alkyl lead compound; and(c)a lead scavenger compound.

[c2] 2.The leaded motor fuel additive composition according to Claim 1, allowing the alkyl lead to be reduced below 0.4 grams per liter while maintaining desired engine performance.

[c3] 3.The leaded motor fuel additive composition according to Claim 1, allowing the alkyl lead to be reduced below 0.2 grams per liter

while maintaining desired engine performance.

- [c4] 4.The leaded motor fuel additive composition according to Claim 1, wherein said additive composition is added to the base fuel in an amount of from about 100 ppm to about 1000 ppm.
- [c5] 5.The leaded motor fuel additive composition according to Claim 1, wherein said additive composition is added to the base fuel containing a detergent in an amount of from about 100 ppm to about 500 ppm.
- [c6] 6.The leaded motor fuel additive composition according to Claim 1, wherein said additive composition is added to the base fuel simultaneously with any other additives.
- [c7] 7.The leaded motor fuel additive composition according to Claim 1, wherein said additive composition is added to the base fuel after any other additives have been added.
- [c8] 8.The leaded motor fuel additive composition according to Claim 1, wherein said alkyl lead compound is selected from the group consisting essentially of tetraethyl lead and tetramethyl lead.
- [c9] 9.The leaded motor fuel additive composition according to Claim 1, wherein said alkyl lead compound is present in a amount of from about 0.05 to about 0.5 grams per liter.
- [c10] 10.The leaded motor fuel additive composition according to Claim 1, where said lead scavenger compound is selected from

the group consisting essentially of ethylene dibromide and ethylene dichloride.

[c11] 11.A leaded motor fuel additive composition which reduces and modifies both fuel intake system and combustion chamber deposit formation for the purpose of reducing engine octane requirement increase and allows the use of lower levels of alkyl lead while retaining engine performance comprising a mixture of:  
 (a)from about 5 to about 50 weight percent, based upon the total weight of components a and b, of a detergent component selected from the group consisting of(i)a reaction product of:(A)a substituted hydrocarbon of the formula  $R_1 - X$  (I)  
 wherein  $R_1$  is a hydrocarbyl radical having a molecular weight in the range of about 150 to about 10,000, and X is selected from the group consisting of halogens, succinic anhydride and succinic dibasic acid, and(B)an amino compound of the formula  $H - (NH - (A)_m)_n - Y - R_2$  (II)

[c12] wherein Y is O or  $NR_5^+$ ,  $R_5$  being H or a hydrocarbyl radical having 1 - 30 carbon atoms; A is a straight chain or branched chain alkylene radical having 1 - 30 carbon atoms; A is straight-chain or a branched-chain alkylene radical having 1 - 30 carbon atoms, m has a value in the range of 1 - 15; n has a value in the range of 0 - 6; and  $R_2$  is selected from the group consisting of H, a hydrocarbyl radical having a molecular weight in the range of

about 15 to about 10,000, and a homopolymeric or heteropolymeric polyoxyalkylene radical of the formula  $R_3 - ((Q)_a(T)_b(Z)_c)_d -$  (III)

[c14] wherein  $R_3$  is H or a hydrocarbyl radical having 1 - 30 carbon atoms, Q, T, and Z are polyoxyalkylene moieties having 1 - 6 carbon atoms, a, b and c each have values ranging from 0 - 30, and d has a value in the range of 1- 50, and(ii)a polybutylamine or polyisobutylamine of the formula



[c15] where  $R_{11}$  is a polybutyl or polyisobutyl radical derived from isobutene and up to 20% by weight of n-butene and  $R_{12}$  and  $R_{13}$  are identical or different and are each hydrogen, an aliphatic or aromatic hydrocarbon, a primary or secondary, aromatic or aliphatic aminoalkylene radical or polyaminoalkylene radical, a polyoxyalkylene radical or a heteroaryl or heterocycl radical, or, together with the nitrogen atom to which they are bonded, form a ring in which further hetero atoms may be present;(b)a fuel conditioner component comprising:(i)from about 2 to about 50 weight percent, based upon the total weight components a and b, of a polar oxygenated hydrocarbon having an average molecular weight in the range of about 200 to about 500, an acid number in the range of about 25 to about 175, and a saponification number

in the range of about 30 to about 250, and(ii)from about 2 to about 50 weight percent, based upon the total of components a and b, of an oxygenated compatibilizing agent preferably having a solubility parameter in the range of about 7.0 to about 14.0 and moderate to strong hydrogen capacity;(c)an alkyl lead compound; and(d)a lead scavenger compound.

- [c16] 12.The leaded motor fuel additive composition according to Claim 11, wherein said alkyl lead compound is selected from the group consisting essentially of tetraethyl lead and tetramethyl lead.
- [c17] 13.The leaded motor fuel additive composition according to Claim 11, wherein said alkyl lead compound is present in a amount of from about 0.05 to about 0.5 grams per liter.
- [c18] 14.The leaded motor fuel additive composition according to Claim 11, where said lead scavenger compound is selected from the group consisting essentially of ethylene dibromide and ethylene dichloride.
- [c19] 15.The leaded motor fuel additive composition according to Claim 11, allowing the alkyl lead to be reduced below 0.4 grams per liter while maintaining desired engine performance.
- [c20] 16.The leaded motor fuel additive composition according to Claim 11, allowing the alkyl lead to be reduced below 0.2 grams per liter while maintaining desired engine performance.

[c21] 17.The leaded motor fuel additive composition according to  
Claim 11, wherein said additive composition is added to the base  
fuel in an amount of from about 100 ppm to about 1000 ppm.